THE EFFECTIVENESS OF MULTIMEDIA
IN EDUCATION PACKAGE TO MOTIVATE LITERACY (MEL)
AMONGST PRESCHOOL CHILDREN

By
MUNIR
Universitas Pendidikan Indonesia

ABSTRACT

Today, the development of multimedia software for the purposes of learning and teaching has received tremendous responses in the education setting. This is not only because of the influence of information technology in the education setting generally, but also due to its capability of motivating students' interest in learning because of the multimedia technology specifically. Multimedia technology is able to motivate children in their learning process due to the fact that the technology can touch various modalities of the children. This research aims to study the effectiveness of MEL in comparison with a conventional literacy programme. To measure the effectiveness of the courseware, the ethnographic and experimental methods were used. The sample of the study comprised of 40 pre-school children: 20 children were taught using the MEL package while the rest using the conventional package called BAWAL. Both packages are underpinned by a whole language philosophy. The data analysis was done using nonparametric approach, namely the Wilcoxon and Mann Whitney tests. The researcher developed an instrument represented in the form of a checklist or matrices to measure the effectiveness of multimedia courseware to motivate literacy. Generally, the findings of the research showed that the use of MEL is more effective in motivating children towards literacy than conventional literacy materials.

1. INTRODUCTION

The presence of multimedia technology opens a new era in the development of teaching and learning media. The ability of multimedia technology in combining various kinds of media like text, voice, picture, numeric, animation, and video in the form of digital software, and its interactive capacity makes it an interesting alternative of learning aids. Multimedia is considered as an impressive learning media because of its capability in activating our perception such our sight, our hearing, and our tactile. Schade in (Hoogeven 1995) believes that "*Multimedia improves sensory stimulation, particularly due to the inclusion of interactivity*".

The Schade study implies that ability to recall by someone memorizing by himself is the lowest (1%). However, when using teaching aids such television and video, our memory capacity can be improved to (25%-30%). The teaching and learning method will improve to 60% if three dimension media (3D) are used.. Al-Seghayer (2001) compared varous types of media in literacy teaching and learning. The study reveals that video clip provides more meaningful impression towards vocabulary acquisition (90%) in comparison to pictures (76%) and text (60%). Multimedia has also the ability in performing 3D concept impressively, as long as the curriculum can be plane systematically, communicatively, and interactively during the teaching and learning process. The findings inspire Heller (Hoogeven 1997) to state that: "*A strong paradigmatic belief can be noted in*

the benevolent effects of multimedia for a wide variety of application domains, particularly Multimedia Assisted Instruction (MAI)".

The studies by Magidson 1978; Koch 1973; Morningstar 1969; Robyer 1988; Wang and Sleman 1994 have shown that the teaching and learning assisted by computer could improve the learners' skills. However, most of the studies emphasize on secondary schools or tertiary education, while those focusing on pre-school level are still rare. The present study emphasizes on literacy learning, especially the teaching and learning of reading skills for pre-school level. This needs to be taken because pre-school education is a basis for further education and reading is one basic subject matter which influences the child's skills in other subjects.

2. PROBLEMS

The function of learning aid is to assist teachers conveying the lesson so that it becomes more impressive and to ease learners in understanding the content of the lesson more impressively. A teacher should be skilful at selecting and using learning media and the teaching process relevant with the needs and situations skilfully and impressively. The presence of new teaching and learning media will not automatically improve the quality of the teaching and learning outcome. Of the many factors influencing the teaching and learning process is the teachers and learners' ability and readiness in using the media. Whatever sophisticated the teaching and learning media is, if not supported by the teacher's ability in planning it well, the use of the learning media will not be meaningful and impressive for the children.

In the past ten years, the study about the development of basic literacy among children has been developed. Marrow 1993). Studies in 1980s and early 1990s indicate that children learned to talk and listen while they were at their pre-school level and will only learn to read and write only when they started their Year 1 in a primary school. (Marrow 1993; Applebee 1983; Bergeron 1990). The current studies (Howland, Laffey & Espinosa 1997; Jones & Liu 1997; Wood 2001) show that children try to acquire skills related to language simultaneously at the earlier stage, namely when they are at their pre-school stage.

Halimah Badioze Zaman (2000) has carried out a study concerning the literacy of Malaysian children. The results show that the society is still left behind in literacy teaching and learning. Most of the children (more or less than 30%) are not able to read when they enter secondary schools (Halimah Badioze Zaman 2000). The children do not show their interest in reading at their early stage. This may be caused by the lack of reading materials written in their mother tongue whether in the form of printing or electronic. The reading materials currently available in a complete version is BAWAL (Early Reading Program) published by the Language and Library Board in 19991 and electronic reading materials known as MEL published by IRPA Universiti Kebangsaan Malaysia (Malaysian National University). The two reading materials use whole language method and story approach.

To test the impressiveness of the two reading materials a research need to be done. BAWAL reading materials represent traditional reading materials compared to MEL which is presented through a computer. Hence, the research problems can be stated as follows:
(a) Is there any significant difference between literacy teaching and learning method using MEL software and literacy teaching and learning using traditional package (BAWAL) ?
(b) Can MEL package motivate literacy in pre-schoolers?

(c) Can learning motivation improve literacy acquisition in preschoolers ?

3. THEORETICAL FRAMEWORK

Multimedia in education is a new concept being introduced to emphasize on the application of multimedia in teaching and learning process. *Multimedia in Education to Motivate Literacy (MEL)* is a concept introduced by Halimah Badioze Zaman (1996) and has been used in this study to form an ID model (*instructional design*) which has been renewed and developed to motivate literacy in preschoolers. Literacy as defined by *International Development Research Centre* (1979) is "the ability to read and write and other useful skills". In the era of economic knowledge (K-economy) emphasizing the use of information and communication technology (ICT), the researchers in designing MEL model should also take into account the ability in using computers as "other useful skills".

According to the study of Morgan & Shade (1994), the reading packages available in the market that can be categorized as feasible and can be used for educational purposes are only 20 - 25%, while 75-80% of the packages are misleading and difficult to use (*not user friendly*). Wright & Shade (1994) state that the impressiveness of a lesson using multimedia technology depends on the quality of the multimedia package itself. This means that designing a package for learning purposes is not as easy as designing an entertainment package. Packages for learning purposes need to be designed carefully in accordance with the learning objectives and should be underpinned by a certain learning theory. Religeluth (Wilson 1997) clarifies that learning and teaching design '*outlined a prescriptive framework for embodying this knowledge*'.

Wright (1994) reiterates that the construction of good literacy packages for children commonly include stories, facilities to draw pictures or design something, write stories helped by pictures, understanding of computer system, developing thought and ideas and vocabulary. MEL packages that have been developed also take into account the requirements proposed by *The National Association for Education of Young Children* (NAEYC) even though including also other aspects such as focusing on cognitive, affective, and psychomotor development, universal values, implementing learning theories, basic education principles, and providing interactive functions for the children to interact with the system or package. The aspects stated will influence the impressiveness of a system or literacy package designed for preschoolers.

4. METHODOLOGY

The aim of the present study is to examine the impressiveness of a case study of using paket (BAWAL and MEL) package among preschoolers in Taman Asuhan Kindergarten.

The method used in this study was a quasi experimental design combined with ethnography approach. The respondents were divided into experimental group (X_1) consisting of 20 respondents using MEL package, and control group (X_2) consisting of 20 respondents using BAWAL package. Both of the groups were given a pretest and posttest. The treatment for the experimental group was multimedia-based, while for control group was traditional-based. Both of the packages were developed according to *whole language philosophy*.

Aspects studied through quasi-experimental design using ethnography methodology is
(i) Literacy motivation based child characteristics, the way they learn and solve their literacy problems, and

(ii) The child literacy ability based on their proficiency in language (reading, recognizing words, recognizing sentences, knowing the meaning, knowing the function and doing creative activities (writing and painting) and proficiencies acquired naturally and computer skills (starting the computer and shutting it down, using the mouse, touching the keyboard, understanding what is the monitor, and the ability to use loudspeaker).

From the aspects mentioned above, three research variables were developed, namely the independent variable related to the multimedia variable and the dependent variable related to literacy. The third variable was the moderator variable related to the child motivation in learning. Literacy ability as understood in this study includes language ability and computer skills.

The data analysis was done after the data were collected. There were two tyeps of data acquired in this study:

(i) Qualitative data: list of progress while the students had a quasi-experimental treatment through quasi eksperimen using senarai semakan (SSM and SSL), pretest and posttest, and data acquired through senarai semakan SSPP (multifaces, text, image, voice, animation and interactive). Data analysis utilized *non parametric* test, namely Wilcoxon analysis, Mann-Whitney and linier regression

(ii) Qualitative data were collected based on Literacy Development Note (LDN) by the researcher and the classroom teachers, interview, and SIK with the headmaster. The analysis used for the qualitative data was descriptive analysis, in which each datum acquired was described in the form of descriptive explanation.

5. RESULTS AND DISCUSSION

This section describes the results of the study acquired through several assessment approaches to find out the impressiveness of MEL in motivating literacy among preschool children. To answer all related questions, the quantitative data will be described below, while the qualitative data will be presented together in the discussion session.

5.1 Results

(i) Can MEL give a significant impression in motivating literacy among preschool children compared to that of BAWAL?

The data analysis concerning the significant impression of using MEL package in motivating the students' literacy compared to BAWAL package indicates that the first hypothesis (H1) or a null hypothesis: *There is no significant difference in motivating literacy among children using MEL package and those using BAWAL package* can be answered through the data on Table 1 below.

Table 1. Statistical Analysis of the Literacy Ability of Group X_1 and Group X_2

	N	Mean	Std.Dev.	Min	Max	25th	50th	50th
Experimental Group	40	2.85	0.7552	1.66	4.22	2.11	2.95	3.60
Control Group	40	0.50	0.5064	0.00	1.00	0.00	0.50	1.00

Based on Table 1 above, the result acquired was based on the value of U=11.000 and the value of Asymp.Sig. (.000). Because the value of Asymp.Sig. (.000) is less than the probability level

assigned, the null hypothesis was rejected. This means that there is a significant difference in scores in the use of MEL package in motivating literacy among preschool children in experimental group compared to that of control group using BAWAL package. The Mann-Whitney test indicates that there is a significant difference in literacy learning using between the students using MEL package and those using BAWAL package (H_0 rejected).

(ii) Can MEL package motivate literacy among preschool children?

The assessment on the significant impression of MEL package on learning motivation of the children has been tested based on the second hypothesis (H2) which is also a null hypothesis: There is no significant difference in the use of MEL package in motivating literacy learning among preschool children. The hypothesis testing has been done for both SSP (between faces, text, image, voice, animation, and interactivity) and SSM data (child characteristics, their learning strategies, and how they solved literacy problems. This second analysis utilized the parameter of multiple linier regressions. Then, to measure the parameter values of MEL software towards learning motivation Minitab software ver. 11 was used.

The results of analysis show the predicting value of D^*_j (4.423) and τ (0.004108). Following the spread of two-sided Chi-Square values, the probability level for *HM* (2153.359) is q (0.000). As the value of the degrees of freedom kebebasan q (.000) is less than the probability level 0.05, the null hypothesis is rejected, meaning that there is a significant impression towards the use of MEL in improving motivation in literacy learning and reading among preschool children. Therefore, the use of MEL package can give a significant on literacy learning motivation among preschool children (H_0 is rejected).

(iii) Can learning motivation increase the literacy acquisition among preschool children?

The assessment towards the significance impression between learning motivation and literacy acquisition has been done through the third hypothesis (H3) which is also a null hypothesis: *There is no significant impression between learning motivation and literacy acquisition among preschool children.*

The hypothesis testing for the hypothesis above (computer literacy + language literacy) has resulted in the predictive value of D^*_j (3.405) and τ (0.2976), so that the value of *HM* (22.891). Following the distribution of two-sided Chi-Square value, the statistic for *HM* (22.891) is q (0.000). As the degree of freedom q (.000) is less than the probability value 0.05, the null hypothesis is rejected. The result indicates that statistically, there is a significant difference in impressiveness between learning motivation and literacy acquisition. Therefore, learning motivation in children provides a significant impression on literacy acquisition. (H_0 is rejected).

5.2 Discussion

The discussion of the research result is based on the quantitative and qualitative analysis from the data collected by the instrument of NPL, SIK and interview guidelines. There are three issues to discuss here including computer and language literacy, children's motivation, MEL software learning material.

5.2.1 Language Literacy

According to NPL, SIK and interview guideline which have been used to examine the ability of children reading aspects including reading and understanding words and sentences. All respondents involved were able to read words and sentences while on the aspects of word and sentence meaning acquisition, respondents of control group is weaker than that of the experimental group. The second aspect studied is writing skill. All respondents were able to write their own names and the names or objects related to the content of the stories. However, the performance of experimental groups is better than that of control group in that the first wrote more names of objects in the stories. Likewise, in the story telling ability, the experimental group performed better than the control group. About the children ability in drawing or painting about the objects, names, or themes related to the stories, the experimental group also performed better than control group.

5.2.2 Computer Literacy

Computer skills that should be acquired by the children are among others the ability in using mouse, knowing the function of keyboard and monitor and use them correctly, knowing how to use CD-ROM, starting and shutting down the computer, and knowing how to decrease or increase the volume. If those skills have been acquired by the children, they will find it easier in using multimedia software for learning purposes. The stage of computer knowledge that should be possessed by the children does not mean they can define or make sense of the components. The knowledge they need is rather on how to use parts for the purpose of learning independently. It has been shown that in the third month of the experiment, the children were able to use the multimedia independently without the support from the researchers or the teachers. In fact they were able to operate computers and learned independently in less than three months.

5.2.3 Children Motivation

The discussion concerning the results of studies based on NPL towards the improvement of the students' motivation will be described below. In depth analysis towards the results of the present study indicates that the success of children in literacy and reading depends genetic factor and reasoning of the children. However, this study also shows that motivations influences literacy and reading success of the children significantly. The role of motivation in literacy learning and reading for children is very crucial for children learning. The improvement of motivation during the first and second month of the study can be examined below.
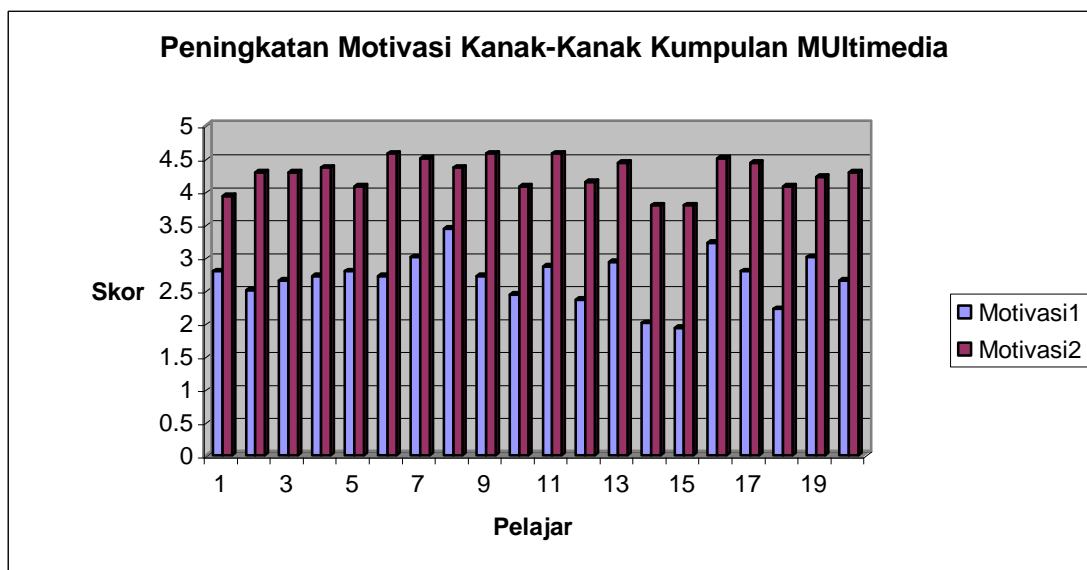
Peningkatan Motivasi Kanak-Kanak Kumpulan MUltimedia

Diagram 1: The improvement of motivation of multimedia group children

5.2.4 Learning Materials: Software MEL

The result of the interview implies that many children were interested in MEL software because the beginning of the software is interesting and arousing the children's curiosity among the children. At the first side the MEL software shows the integration among texts, graphics, voice/music and animation. The screen welcomes and greets the children and invites them to try the software. Clear instruction in MEL software makes it user friendly and motivate the children to learn independently. MEL software has various buttons for certain functions. The shape of the buttons was designed according to intuitive metaphor concepts which allow the children to identify the buttons intuitively.

6. CONCLUSION

The results of the study show that children were motivated to learn literacy more impressively if the teaching and learning process involves the utilisation of MEL package. The situation persists because children will have higher motivation if they are able to absorbs and understand what they learn in their literacy program. The MEL package has been able to improve the children's motivation through multimedia technologies it adopts. Even though BAWAL package could motivate the children through the use of graphics and interesting story themes, the package cannot equalise MEL package because the later is able to involve the children interactively and independently so that they can learn at their own pace. The children will also be able to repeat any modules for better understanding. This will enhance children learning based on their own speed. (*self-paced learning*).

Bibliography

Al-Seghayer, K. 2001. The effect of multimedia annotation modes on L2 vocabulary acquisition: A comparative study. *Language Learning & Technology*, **5**(1): 202-232.

Halimah Badioze Zaman, Norhayati Abdul Mukti, Munir, Nor Azan, Siti Rohaya Ariffin, Tengku Mohd.Tengku Sembok dan Mohamed Yusoff. 2000. Motivating literacy through MEL : A multimedia based tutoring system. *New Review of Children's Literature and Librarianship*. Vol.**6**. Taylor Graham, United Kingdom.

Hoogeveen, M. 1995. Toward a theory of the effectiveness of multimedia system. *http://cyber-ventures.com/mh/paper/mmtheory.htm* [20 April 1988].

Hoogeveen, M. 1997. Toward a new multimedia paradigm: is multimedia assisted intruction really effective. *http://cyber-ventures.com/mh/paper /mthedu.htm* [20 April 1988].

Howland, J., Laffley, J. & Espinosa, L.M. 1997. A computer experience to motivate children to complex performance. *Journal of Computing in Childhood Education*, 8(4) : 291-312.

International Development Research Centre. l979. *The World of Literacy: Policy, research and Action*. Canada.

Kulik, J.A., Kulik, C.C. & Cohan, P.A. 1980. Effectiveness of Computer-Based College Teaching : A Meta-Analysis of Findings. *Review of Educational Research*. **50** (4) : 525-544.

Kulik, J.A., Bangert, R.L., & Williams, G.w. 1983. Effects of Computer-Based Teaching On Secondary School Students. *Journal of Educational Psychology*. **75**(1) : 19-26.

MacHado, J.M. 1995. *Early Childhood Experiences in Language Arts : Emerging Literacy*. New York : Delmar Publishers

Magidson, E.M. 1978. Issue Overview : Trends in Computer Assisted Instruction. *Education Technology*. **18**(4) : 5.

Marrow, L.M. 1993. *Literacy Development in The Early Years*. Ed.ke-2. USA : Allyn & Bacon.

Mathis,A., Smith, T., & Hansen, D. 1970. College Students Attitudes Toward Computer Assisted Instruction. *Journal of Educational Psychology*. **6l**(1) : 46-51.

Morgan, G. & Shade, D. 1994. Moving early chilhood education into the 21 st century. In. J.L. Wright, & D.D. Shade (Eds.), Young children : Active learners in a technological age. Washinton, D.C.: National Association for the Education of Young Children.

Munir. 1998. "Pengajaran Membaca bagi Anak-anak melalui Bahasa Menyeluruh". dlm. *Jurnal Dewan Bahasa* 42:2 Februari 1998. Kuala Lumpur.

Munir & Halimah Badioze Zaman. 1998. "Menggalakan Kanak-kanak Belajar Membaca Berbantukan Multimedia," dlm. *Jurnal Dewan Bahasa* 42:12 Disember 1998. Kuala Lumpur.

Munir & Halimah Badioze Zaman. 1998. "MEL : Meningkatkan kreativitas berbahasa bagi kanak-kanak prasekolah," dlm. *Jurnal Dewan Bahasa* 43:4 April 1999. Kuala Lumpur.

Munir & Halimah Badioze Zaman. 1999. Aplikasi Multimedia dalam Pendidikan, *Jurnal Bahagian Teknologi Pendidikan*. Bil.**1**(1999) Kementerian Pendidikan Malaysia. Kuala Lumpur.

Munir & Halimah Badioze Zaman. 2000. Aplikasi Multimedia dalam Pendidikan untuk menggalakkan literasi, *Pemikir,* 51-76. Jan-Mac 2000. Kuala Lumpur:Utusan Melayu.

Nunan, D. 1988. *The Learner Centred Curriculum a Study in Language Teaching*. Cambridge: Cambridge University Press.

Reigeluth, C. 1992. Elaborating the elaboration theory. *Educational Tchnology Research and Development* **40**:3 hlm.80-86.

Rich, D. 1998. Helping Your Child Succeed in School. http://nic.smsu.sdu/~alh004s/ Stuff/articles.html [2 Februari 1998].

Wood, J. 2001. Can software support children's vocabulary development. *Language Learning & Technology* **5**(1) : 166-201

Wright, J.L. 1994. *Listen to the children : Observing young children's discoveries with the microcomputer*. In. J.L. Wright, & D.D. Shade (Eds.), *Young children : Active learners in a technological age*. Washinton, D.C.: National Association for the Education of Young Children.

Wright, J.L. & Shade, D. 1994. Young children : *Active learners in a technological age*. Washinton, D.C.:National Association for the Education of Young Children.

Yelland, N., Griesshaber, S., Stokes, J., & Masters, J. 1997. Integrating technology, teaching and learning with early chilhood professionals. *Proceeding of SITE 97*. http://www.coe.uh.edu/insite/elec_pub/HTML1997[1998, November 18].